

CLAIMS

1. In a mobile communication device, a method of selecting a communication network which provides one or more communication services for the mobile communication device, the method comprising the acts of:

performing a scanning operation to identify one or more communication networks that support a voice communication service in a geographic coverage area;

determining which communication networks make a data communication service available to the mobile communication device in the geographic coverage area;

selecting or assigning priority to a network that makes the data communication service available over a network that fails to make the data communication service available; and

registering with the selected or prioritized communication network.

2. The method of claim 1, wherein the data communication service comprises at least one of an electronic mail (e-mail) service, a short messaging service, and an Internet access service.

3. The method of claim 1, wherein the one or more communication networks comprise one or more cellular telecommunication networks.

4. The method of claim 3, wherein operation of the one or more cellular telecommunication networks is governed by Global Systems for Mobile (GSM) standards.

5. The method of claim 3, wherein operation of the one or more cellular telecommunication networks is governed by General Packet Radio Service (GPRS) standards.

6. The method of claim 1, wherein the act of determining which communication networks make a data communication service available comprise the further acts of:

attempting to access the data communication service over the communication network; and

being granted or unable to access the communication service over the communication network.

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7. The method of claim 1, wherein the act of selecting or assigning priority to a communication network comprises the further act of creating a prioritized list of communication networks by prioritizing those networks that make the data communication service available over those networks that fail to make the data communication service available.

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8. A mobile communication device, comprising:

a cellular transceiver;

an antenna coupled to the cellular transceiver;

15 one or more processors coupled to the cellular transceiver;

said one or more processors being configured to select a communication network over which to communicate by:

performing a scanning operation to identify one or more communication networks that support a voice communication service in a geographic coverage area;

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determining which communication networks make a data communication service available to the mobile communication device in the geographic coverage area;

selecting or assigning priority to a network that makes the data communication service available over a network that fails to make the data communication service available; and

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registering with the selected or prioritized communication network.

9. The mobile communication device of claim 8, wherein the data communication service comprises at least one of an electronic mail (e-mail) service, a short messaging service, and an Internet access service.

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10. The mobile communication device of claim 8, wherein operation of the cellular transceiver is governed by Global System for Mobile (GSM) and General Packet Radio Service (GPRS).

5 11. The mobile communication device of claim 8, wherein the one or more processors is further configured to determine which communication networks make a data communication service available by performing the further acts of:

attempting to access the data communication service over the communication network; and

10 being granted or unable to access the communication service over the communication network.

12. The mobile communication device of claim 8, wherein the act of selecting or assigning priority to a communication network comprises the further act of creating a
15 prioritized list of identified communication networks by prioritizing those networks that make the data communication service available over those networks that fail to make the data communication service available.

13. In a mobile communication device, a method of creating a prioritized list of
20 communication networks comprising the acts of:

scanning to identify a plurality of communication networks which support a voice communication service in a given geographic region;

identifying one or more communication networks that make a data communication service available to the mobile communication device; and

25 assigning a higher priority in the prioritized list to the one or more communication networks identified to make the data communication service available than those one or more communication networks not making the data communication service available.

14. The method of claim 13, wherein:
30 the prioritized list comprises a plurality of sub-lists; and

the act of assigning comprises the further act of storing identities of the one or more communication networks identified to make the data communication service available in a higher priority sub-list of the prioritized list.

5 15. The method of claim 13, comprising the further acts of:
for each communication network:

 identifying whether a communication network is a forbidden communication network; and

 wherein the act of assigning comprises the further act of assigning the
10 communication network a higher priority in the prioritized list if the communication network is not a forbidden communication network.

 16. The method of claim 15, wherein the act of identifying whether the communication network is a forbidden communication network comprises the further act of
15 comparing the communication network to entries of a list of forbidden communication networks.

 17. The method of claim 15, further comprising the act of:
 adding the communication network to a forbidden network list if a communication
20 failure occurs with the communication network.

 18. The method of claim 15, further comprising the act of:
 identifying whether the communication network is in the prioritized list;
 reassigning a priority to the communication network in the prioritized list if the
25 communication network is a forbidden communication network.

 19. The method of claim 18, wherein:
 wherein the prioritized list comprises a plurality of sub-lists;
 wherein the act of reassigning priority to the communication network comprises the
30 further acts of:

moving the communication network from one sub-list of the prioritized list to another sub-list of the prioritized list;
removing the communication network from the prioritized list; and
adding the communication network to a different sub-list of the prioritized list.

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20. The method of claim 13, further comprising the acts of:
for each communication network:

identifying whether the communication network is a preferred communication network; and

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if the communication network is a preferred communication network and makes the data communication service available, then assigning the communication network a higher priority in the prioritized list than other communication networks that make the data communication service available but are not preferred communication networks.

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21. The method of claim 20, wherein the act of identifying whether the communication network is a preferred communication network comprises the act of comparing the communication network to entries in a communication network list.

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22. The method of claim 21, wherein the communication network list comprises one or more sub-lists established by one or more of:

a user of the mobile communication device;
a manufacturer of the mobile communication device; and
an operator of a communication network.

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23. The method of claim 22, wherein the preferred list comprises a plurality of sub-lists, including a sub-list established by a user, a sub-list established by a manufacturer, and a sub-list established by an operator of a communication network, and wherein the method further comprises the acts of:

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for each communication network:

wherein the act of determining if the communication network is a preferred communication network comprises the further act of determining on which sub-list of the communication network list the communication network is listed; and

5 wherein the act of assigning comprises the further act of assigning the communication network a higher priority in the prioritized list than other communication networks if the network is on the sub-list established by the user.

24. The method of claim 13, further comprising the acts of:
for each communication network:

10 if the communication network supports the data communication service:
determining whether the communication network is known; and
if the communication network is known: assigning the known communication network a higher priority in the prioritized list than any unknown communication network.

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25. The method of claim 24, further comprising:
wherein the act of determining if the communication network is known comprises the further act of comparing the communication network to entries of a list of communication networks

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26. The method of claim 24, wherein the prioritized list comprises a plurality of sub-lists and the act of assigning the communication network priority comprises the further act of:

25 placing the known communication network in a higher priority sub-list of known communication networks over a sub-list of unknown communication networks.

27. A method of claim 24, wherein the prioritized list comprises a plurality of sub-lists and the method comprises the further act of:

30 if the communication network is unknown and does not make the data communication service available:

assigning the communication network a lower priority in the prioritized list by placing it in a lower priority sub-list comprising known voice-capable communication networks under a sub-list of unknown communication networks that make the data communication service available.

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28. The method of claim 13, wherein the communication networks comprise GSM/GPRS communication networks and GSM communication networks, where the GSM communication networks do not support the data communication service.

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29. The method of claim 13, wherein the mobile communication device comprises at least one selected from the group consisting of: a cellular mobile station with GPRS capabilities, a wireless-enabled Personal Digital Assistant (PDA), a wireless Internet appliance, a data communication device with telephony capabilities, a portable e-mail pager, and a wireless modem.

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30. The method of claim 14, wherein the prioritized list comprises four sub-lists including, in decreasing order of priority: a User Preferred Public Land Mobile Network List (U-PPLMN), an Operator Preferred Public Land Mobile Network List (O-PPLMN), an Unknown Voice/Data List, and an Unknown Voice-Only List.

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31. The method of claim 16, wherein the list of forbidden communication networks comprises a Forbidden Public Land Mobile Network (PLMN) list.

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32. The method of claim 24, wherein the list of communication networks that is used for comparing comprises a User Preferred Public Land Mobile Network (O-PPLMN) list and an Operator Preferred Public Land Mobile Network (O-PPLMN) list.

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33. In a mobile communication device, a method for creating a prioritized list of communication networks comprising the acts of:
scanning to identify one or more communication networks which support a voice communication service in a given geographic region;

for each communication network identified:

determining whether the communication network is a known communication network of the mobile communication device; and

5 if the communication network is a known communication network, then assigning the communication network a higher priority in the prioritized list than a communication network that is an unknown communication network.

34. The method of claim 33, wherein:

10 the act of determining if the communication network is known comprises comparing the communication network to entries in a communication network list.

35. The method of claim 33, wherein:

15 the prioritized list comprises a plurality of sub-lists including one or more sub-lists established by the user of the mobile station, an operator of a communication network, and a manufacturer of a mobile station; and

the act of assigning the communication network a higher priority in the prioritized list comprises the act of placing the communication network in a higher priority sub-list of the prioritized list.

20 36. The method of claim 33, comprising the further acts of:
for each communication network identified:

determining whether the communication network makes a data communication service available;

25 if the communication network is known and makes the data communication service available to the mobile communication device:

assigning the communication network a higher priority in the prioritized list over an unknown communication network that makes the data communication service available.

30 37. The method of claim 33, wherein:

the prioritized list comprises a plurality of sub-lists; and

the act of assigning higher priority to a known communication network that makes the data communication service available comprises the further act of placing the network in a higher priority sub-list of the prioritized list.

5 38. In a mobile communication device, a method of selecting a communication network comprising the acts of:

 waiting for an expiration of a network rescan timer;

 after the expiration of the network rescan timer;

 performing a scanning operation to identify one or more communication
10 networks that support a voice communication service in a geographic coverage area;

 determining whether any of the communication networks make a data communication service available to the mobile communication device in the geographic coverage area;

 if a communication network makes the data service available to the mobile
15 communication device:

 selecting or assigning priority to it over a network that fails to make the data communication service available;

 registering with the selected or prioritized communication network;

 and

20 if no communication network makes the data communication service available to the mobile communication device, resetting the network rescan timer.

 39. In a mobile communication device, a method of selecting a cellular network for communications comprising the acts of:

25 performing a scanning operation to identify one or more cellular networks in a geographic coverage area;

 identifying which of a plurality of communication services, if any, are made available by each cellular network for the mobile communication device;

 determining which cellular network makes the largest number of preferred
30 communication services available to the mobile communication device; and

assigning network selection priority to the cellular network that makes the largest number of preferred communication services available to the mobile communication device.

40. The method of claim 39, wherein the plurality of communication services
5 comprise at least one data communication service.

41. The method of claim 39, wherein the plurality of communication services
comprise at least one of an electronic mail (e-mail) service, a short messaging service, and an
Internet access service.

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42. The method of claim 39, wherein the act of identifying which communication
services are made available by a cellular network comprises the further acts of:

attempting to access a communication service over the communication network; and

being granted or unable to access the communication service over the communication
15 network.

43. The method of claim 39, wherein the act of assigning network selection
priority comprises the further act of:

creating or modifying a prioritized network list stored in memory of the mobile
20 communication device.

44. In a mobile communication device, a method of selecting a communication
network comprising the acts of:

identifying one or more communication networks available to facilitate mobile
25 communications with the mobile communication device in a geographic coverage area;

identifying one or more communication services that are actually made available with
each communication network;

determining which communication network provides the best communication services
for the mobile communication device based at least in part on the identified availability of
30 communication services in each communication network;

selecting or assigning priority to the communication network that is determined to provide the best communication services for the mobile communication device; and registering with the selected or prioritized communication network.

5 45. The method of claim 44, wherein the act of determining which communication network provides the best communication services for the mobile communication device comprises the further act of:

determining that the communication network has a greater or equal number of communication services available to the mobile communication device than any other
10 identified communication network.

46. The method of claim 44, wherein the act of determining which communication network provides the best communication services for the mobile communication device comprises the further act of:

15 determining that the communication network has a greater or equal number of preferred communication services available to the mobile communication device than any other identified communication network.

47. The method of claim 44, wherein each communication service is assigned a weight value, and wherein the act of determining which communication network provides the best communication services for the mobile communication device comprises the further acts of:

for each communication network, calculating a sum of weight values of all of the communication services made available in the communication network; and

25 determining that the communication network has a sum of weight values that is greater than or equal to that of any other identified communication network.

48. The method of claim 44, wherein the act of assigning priority comprises the further act of:

30 creating or modifying a prioritized network list stored in memory of the mobile communication device.

49. The method of claim 44, wherein the communication services comprise one or more data communication services.

5 50. The method of claim 44, wherein the communication services comprise a plurality of the following services: a voice communication service; an electronic mail service; a short messaging service; an Internet access service; a private Intranet access service; and a wireless application protocol (WAP) service.